NRA Northumbria & Yorkshire 65
PLEASE RETURN TO DASTOFF.

NRA
National Rivers Authority
Northumbria & Yorkshire Region

DOE LEA RESTORATION STUDY

PROJECT ASSESSMENT

AND

BEST PRACTICES IDENTIFIED

REPORT

John Cross - Project Manager
National Rivers Authority
Northumbria & Yorkshire Region
Olympia House
Gelderd Lane
Gelderd Road
Leeds LS12 6DD

Tel:- 0113 244 0191
Fax:- 0113 231 2116

NOVEMBER 1995

CONTENTS

File:- 1.785
Date:- 24/11/95

CONTENTS - Continued

CONTENTS - Continued

EXECUTIVE SUMMARY

In the summer of 1991 following reports of milk contaminated with dioxins, sediment samples were collected from the River Doe Lea near Bolsover in north east Derbyshire. The Doe Lea is a tributary of the River Rother which joins the River Don to flow into the Humber Estuary. Normal background levels of dioxins were found in the streams draining the affected farms. However, the Doe Lea was found to be very highly contaminated with dioxins with levels in excess of five hundred times greater than those found elsewhere in England and Wales.

In September 1994, a project was authorised by the National Rivers Authority to investigate, initiate, recommend and instigate future action by the NRA on dioxin contamination within the Doe Lea sediments. This project was called "The Doe Lea Restoration Study". The prime purposes of the Project were to investigate ways of cleaning up the dioxin pollution within the Doe Lea and, if viable, carry out the clean up of a short section of river. The study incorporated the investigation of legal action against the polluter under Section 161 of the Water Resources Act 1991.

The main purpose for the production of this report is to act as a guidance document for future NRA or Environmental Agency action in the event of a major pollution incident which requires remedial action and/or complex legal case to be prepared to establish responsibility and recovery of costs.

The secondary purpose for the production of this report is to review and assess the NRA's performance in dealing with the dioxin contamination discovered in the River Doe Lea in 1991.

There were three mains areas of investigation in the study:-

* analysis of samples and identification of the source of the dioxins
* determining the effects of dioxins on the aquatic environment
* risk assessment of the options available to clean up the river

External experts were appointed to support and reinforce the NRA on all of these areas and external solicitors were also appointed to give expert legal advice and formulate the legal case.

The internal NRA Project Team comprised:-

John Cross - Project Manager
Jill Credland - Environmental Protection Team Leader
Lara Dalton - Press & Public Relations Officer
Damien Healey - Solicitor

The Project Board comprised:-

Gerard Morris	- Water, Resource & Quality Manager - Project Executive
Brain Bramman	- Don & Aire District Engineer
Peter Crane	- Business Accountant
Julie Gledhill	- Procurement Manager (on the Project Board until June 1995)
Garry Greenlay	- Business Services Manager (on the Project Board from June 1995)
John Pygott	- Ecology & Recreation Manager

All outside experts were interviewed, assessed and appointed by February 1995. They were:-

Professor Hagenmaier of the University of Tubingen - Analysis and source identification
Dibb Lupton Broomhead - All legal aspects of the project
Ove Arup - Design, risk assessment and safety aspects of potential clean up operations
WRc - Effects of dioxins on the aquatic environment

In March 1995, extra sampling identified as being essential by the requirements of the project showed that dioxins levels had reduced by 95% but were still ten to fifty times above normal levels. By July 1995, after full and thorough investigation of all the options, the project concluded that the best and safest option was to allow the river to continue to cleanse itself naturally and to monitor the river until dioxin levels returned to normal background levels.

In addition to a satisfactory resolution of the problem of how the NRA should deal with the dioxin contamination of the Doe Lea, other more general, major outputs of the project are:-

* Draft Environmental Quality Standards for dioxins.
* Trigger levels of dioxins where remediation should be considered.
* Outline methodology for determining EQSs for pollution adhering to sediments.
* Review and risk assessment of clean up methods.
* Legal robust methodology for sampling polluted sediments.

In the development of techniques and methodologies to deal with large scale sediment contamination in a river and the preparation of the associated complex legal case, the project has identified many ways in which the handling of any future similar case could be benefitted.

This report reviews and assesses the progress on the project and identifies and compiles seventy examples of best practice. Of these seventy, there are seven best practices identified which would have a major impact on any future work carried out by the National Rivers Authority or Environment Agency. These are:-

* Establish a project immediately with a dedicated Project Team.
* Develop the legal case at the same time as any clean up and further sampling.
* Regular expert witness meetings.
* Assess NRA liabilities at the outset and reassess at major changes.
* Establish a legally robust sampling methodology.
* What If scenarios
* Establish a Public Relations Strategy

The best practices identified in this report are applicable in part or as a whole to a range of complex pollution incidents which may face the Environmental Agency in the future.

1.0 PURPOSE OF THE REPORT & MAIN FINDINGS

1.1 PURPOSE

1.1.1 The main purpose for the production of this report is:-

* To act as a guidance document for future NRA or Environmental Agency action in the event of a major pollution incident which requires remedial action and/or complex legal case to be prepared to establish responsibility and recovery of costs.

1.1.2 The secondary purpose for the production of this report is:-

* To review and assess the NRA's performance in dealing with the dioxin contamination discovered in the River Doe Lea in 1991.

1.1.3 The best practices identified in this report are applicable in part or as a whole to a range of complex pollution incidents which may face the Environmental Agency in the future. Particular help is given in dealing with incidents which:-

* Relate to sediment borne contamination.
* Rely on having to trace a complex chemical back to its potential source.
* Give rise to a complex legal case with a number of issues and potential expert witnesses.
* Incidents with high public interest and worries.

1.2 KEY BEST PRACTICES IDENTIFIED

1.2.1 In the opinion of the Project Team and Project Board, the key best practices identified by the Doe Lea Restoration Study for major, complex pollution incidents are:-

* Establish a project immediately with a dedicated Project Team.

* Develop the legal case at the same time as any clean up and further sampling.

* Regular expert witness meetings.

* Assess NRA liabilities at the outset and reassess at major changes.

* Establish a legally robust sampling methodology.

* What If scenarios

* Establish a Public Relations Strategy

2.0 OVERVIEW OF PROJECT

2.1 BACKGROUND

2.1.1 In the summer of 1991 following reports of milk contaminated with dioxins, sediment samples were collected from the River Doe Lea and its tributaries near Bolsover, Derbyshire. The Doe Lea is a tributary of the River Rother. Normal background levels were found in the streams draining the affected farms. However, the Doe Lea was found to be very highly contaminated with dioxins.

2.1.2 Th ence
of e of
dic ry in
the ment
str was
bei and
eff Lea
tog e of
pai plan
cor the
cor oard
fro

2.2 DIOXINS

2.2.1 Dioxins, chemical name, polychlorinated dibenzo-para-dioxins and the associated furans form a group of over 200 closely related chemicals and are found in trace quantities almost everywhere in the environment. None are produced intentionally and they have no known use.

2.2.2 Dioxins are formed as unwanted by-products in certain chemical processes involving chlorine and can contaminate the resulting products and waste. They are also formed in minute amounts during the combustion of fuels, incineration of waste and other fires involving organic materials e.g. forest fires.

2.2.3 Some dioxins are very toxic and can accumulate in aquatic animals over a period of time. The reported toxicity in the scientific literature before the start of the Project varied widely but the analysis of the Doe Lea samples indicated that the overall toxicity levels were some thousand times higher than normal background levels. No Environmental Quality Standards for the protection of the water environment from the effects of dioxins have been set in the United Kingdom.

2.2.4 Chemical analysis for dioxins is time consuming, complex and very expensive (normally £750 -£1,000 per sample).

2.3 EVENTS LEADING UP TO THE START OF THE PROJECT

2.3.1 A survey in October 1991 confirmed the initial results with the presence of high levels of dioxins downstream of the discharges from Coalite Chemicals Limited. In a reply to a Parliamentary Question, it was reported the investigations by Her Majesty's Inspectorate of Pollution had found that the atmospheric emissions from the toxic waste incinerator at Coalite were the probable source of a proportion of the dioxins present in milk from the neighbouring farms.

2.3.2 The incinerator was closed at the end of November 1991 for modernisation and has not reopened since. Subsequently, the farmers through the National Farmers Union initiated a legal action against Coalite which was settled out of court. Details of this settlement are not available.

2.3.3 In 1992 and 1993, the NRA took further samples including formal samples of effluent from Coalite. Samples from the river sediments were collected to determine the extent of dioxin contamination downstream.

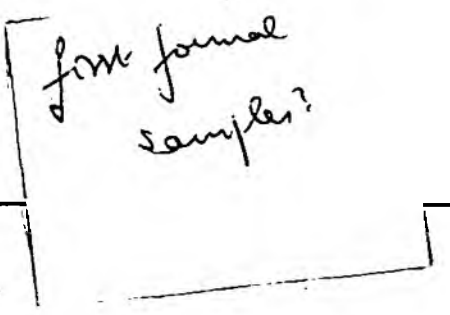
2.3.4 In a separate development, as part of the NRA's national Research and Development programme, a survey of dioxin contamination within England and Wales was carried out. When compared to the other sites sampled the Doe Lea was many hundreds of times higher than anywhere else surveyed.

2.3.5 Legal opinion was sought from a Queen's Counsellor on the likelihood of a successful prosecution and after receiving this the NRA announced its intention to take a civil action against Coalite under Section 161 of the Water Resources Act.

2.4 THE DOE LEA RESTORATION STUDY

2.4.1 In August 1994, a Project Initiation Document was prepared and approved for a project to investigate, recommend and instigate future NRA action on dioxin contamination within the Doe Lea sediments. The project had a budget of £500,000 and included provision for a pilot scheme to clean up a short section of the Doe Lea should this have proved viable. This Project was called "The Doe Lea Restoration Study".

2.4.2 The prime purposes of the Project were to investigate ways of cleaning up the dioxin pollution within the Doe Lea and then, if viable, carry out the clean up of a short section of the river. The study incorporated the investigation of legal action against the polluter under Section 161 of the Water Resources Act.



2.4.3 There were three main areas of investigation in the study and expert consultants were appointed to undertake the following:-

* Analysis of further samples from the sediments of the Doe Lea to determine current levels of dioxin pollution and, if possible, to prove the source of the pollution. This was carried out by Professor Hagenmaier of the University of Tubingen, Germany, who is one of the leading European experts in the field of dioxin analysis.

* Determination of the effects of varying dioxin levels on the aquatic environment. This work was carried out by WRc of Medmenham and utilised their great experience in the fields of dioxin and the aquatic environment in general.

* Risk assessment of the options for carrying out any sediment clean up. This was carried out by Ove Arup, Consulting Engineers.

2.4.4 In addition, legal advice on all aspects of the project and preparation of the legal case against the polluter, was provided by the Solicitors, Dibb Lupton Broomhead.

2.5 RESULTS OF THE PROJECT

2.5.1 Samples of the sediments in the Doe Lea taken in March 1995 showed that dioxin levels had reduced by 95% since samples were taken in 1991. However, levels were still between 5 and 40 times higher than any other levels detected elsewhere in England and Wales and were still high enough to cause concern.

2.5.2 Many options were examined for dealing with the dioxin polluted sediments which covered treatment in-situ, removal, separation from the river water by a number of methods and transport from site. In addition methods for the ultimate disposal of the sediments such as incineration and landfill were also investigated.

2.5.3 The result of the risk assessment carried out by Ove Arup of the various options showed that the safest option was not to disturb the sediments and allow the river to disperse the contaminants naturally.

2.5.4 The main conclusions of the Doe Lea Restoration Study Project were:-

* Levels of dioxins had fallen by 95% and were now approaching levels at which they would cease to be a hazard to the aquatic environment.

* The best and safest option for dealing with the dioxins was to continue allowing them to disperse naturally.

* No legal case could now be taken by the NRA against the polluter, although another case related to dioxins was to be brought by HMIP.

* Coalite Chemicals Limited was the likely source of the dioxin pollution in 1991 but the NRA was now ensuring that there would be no reoccurrence. Any current dioxins were well below levels at which they would be a problem.

* The NRA would continue to monitor the river until the dioxins reduced to normal levels.

* Other NRA instigated initiatives meant that there had been a significant improvement in the overall state of the Doe Lea.

* The NRA would report back on progress to the public.

2.6 LEGAL POSITION

2.6.1 In 1992, the NRA was given expert legal advice that a criminal prosecution under Section 85 of the Water Resources Act was very likely to be unsuccessful primarily because of the wording of the Discharge Consent but also because of lack of data on the harmful effects of dioxins on aquatic life and lack of proof of linking the dioxins to Coalite Chemicals. This was a consent that had been inherited by the NRA from Yorkshire Water. A clean up of the sediments followed by recovery of costs under Section 161 was considered to be the only viable way for the NRA to establish legal responsibility against the polluter. As the NRA will not be carrying out any clean up of the river, no legal case can now be taken against the polluter.

2.7 IDENTIFICATION OF THE POLLUTER

2.7.1 From the evidence and advice of its experts, the NRA is satisfied that the most probable source of the dioxin pollution in 1991 was Coalite Chemicals Limited.

2.7.2 Since 1991, Coalite Chemicals has ceased operating its incinerator, which was the most likely producer of the dioxins and carried several modifications and improvements to its drainage system. These improvements include routing all discharges to an improved biological effluent treatment plant and the construction of a storm water storage lagoon to prevent inundation of the treatment plant during heavy rainfall.

2.8 HMIP LEGAL CASE

2.8.1 The HMIP case against Coalite Chemicals for the airborne escape of the dioxins in 1991, was initially heard at Nottingham Crown Court on 20 July 1995. The full case is to be heard at Leicester Crown Court on 12 January 1995. Eight weeks have been allocated to hear the case and so the case may not be decided until after HMIP has joined with the NRA and Waste Regulators to form the new Environment Agency.

2.9 PUBLIC RELATIONS

2.9.1 The local residents, local authorities, MPs, MEPs, RRAC and media have been kept fully informed on all progress and developments on the Doe Lea Restoration Study and public comments have been actively sought.

2.9.2 A public meeting and press conference were held in Staveley on 23rd May to announce the results of the March 1995 sediment samples, and to announce the NRA's intention for fully investigating options for dealing with the dioxin pollution and, if safe to do so, cleaning up a section of the Doe Lea.

2.9.3 On the 18th July 1995, a briefing of local authority Councillors, a public meeting and a press conference were held in the Staveley area, to announce the conclusions of the Project detailed in Section 2.5.4 above.

2.9.4 There was general, but by no means universal, acceptance of the NRA's decision not to attempt to remove the dioxins, but there was great public concern that Coalite Chemicals were seen to be escaping sanctions.

2.10 FUTURE ACTION BY NRA UNDER PROJECT

2.10.1 The following actions are being implemented:-

1. A programme of monitoring has been established on the Doe Lea, Rother and Don to determine the extent, concentrations and movements of dioxins within the river system.

2. A plain English report is being produced on the Doe Lea Restoration Study for public release.

3. Public Meetings and liaison meetings with local authorities will be held in October/November.

4. All information and findings from the Project on the effects of dioxins on the aquatic environment will be further developed to produce an Environmental Quality Standard for dioxins.

5. The data and methodology produced by the Project will provide a basis for the assessment of other sediment borne contaminants.

5. The possibility of promoting an International conference on dioxins is being investigated.

EQS = 0?

Would bio-plant be any use? in conservation/primary source?

3.0 EARLY ESTABLISHMENT OF PROJECT

3.1 HISTORY

3.1.1 The NRA first became aware of the possibility of dioxins affecting the Doe Lea in the early summer of 1991 when the Ministry of Agriculture Fisheries and Food reported finding elevated levels of dioxins in milk from around the Coalite Chemicals Site. This was the first experience within the NRA of a potentially major dioxin contamination of a river or watercourse.

3.1.2 Sampling of the river sediments in July, October and November of 1991 indicated that the dioxins were the result of a direct discharge to river rather than the result of airborne emissions being washed down into the river. This was further confirmed by samples taken in January and April 1992 and March 1993.

3.1.3 In June 1992, a year after the problem was first identified, legal opinion was sought from an expert Queen's Counsellor. This opinion was that a "prosecution is unlikely to succeed". It also drew the NRA's attention to the fact that, following the decision in the Harcros case, formal tripartiting of all samples was essential otherwise the results could not be considered to be legally admissible.

3.1.4 During the period of 1993 to 1994, WRc (with some assistance from the Institute of Freshwater Ecology) carried out investigations into sediments of the Doe Lea and their possible effects on aquatic life.

3.1.5 In 1994, the line of argument was developed that the NRA could carry out a limited clean up of the dioxins in the Doe Lea and then reclaim the costs of doing this from Coalite Chemicals if they could be proved to be the source of the dioxins. The merits of this approach as opposed to a prosecution is discussed in Section 3 - Legal Case.

3.1.6 In September 1994, a Project Initiation Document was agreed setting up the Doe Lea Restoration Project with a budget of £500,000. This was three years after the problem was first identified.

3.1.7 The Project Executive was formed from an informal management group which had been overseeing the work from mid 1994. A Project Manager was appointed in December 1994.

3.1.8 The Project was brought to a conclusion satisfactory to the NRA in June 1995 with the decisions to:

* allow the river the clean itself naturally

* not to proceed with any legal action

* to institute a programme of downstream monitoring.

This was nine months after the setting up of the Project.

3.1.9 All the works and information necessary to arrive at the above decisions were carried out and developed with the Project. With the exception of the sample results, there was little reliance placed on work carried out prior to August 1994.

3.2 DISCUSSION

3.2.1 Delays in response to serious incidents of pollution inevitably make effective action and successful legal cases more difficult and problematic.

3.2.2 Delays in developing a legal case and/or initiating remedial actions may cause abortive or inefficient use of staff time and other resource costs.

3.2.3 In order to avoid unnecessary delays, it is imperative that the available courses of action are identified as soon as possible and that the preferred course of action is implemented speedily.

3.2.4 The basic courses of action that the NRA could have taken after the discovery of dioxins were limited to four:

* Criminal Prosecution
* Clean up and recovery of costs unc ces Act 1991
* NRA clean up and set a precedent f all of the clean up.
* No action

Pre-NRA
other powers of Coalite Consent? warfare one

(The additional option under the new Environmental Protection Act of requiring the polluter to clean up carries similar legal implications to Section 161 action. This is discussed in detail in Section 5 - Legal Case).

Decisions on the basic course of action should be taken as soon as the sample results are known.

3.2.5 Between January 1992 and April 1994, much time and effort was put into the research of the effects of dioxins as these were not known at the time and no standards existed. This was not focused on any target for the Doe Lea but instead was an attempt to gain more information prior to making an as yet unspecified decision. This caused delay. There were also delays associated with obtaining the results from some of the sample analyses.

3.2.7 Had the Project been established at the beginning of 1992, instead of September 1994, the timescale thereafter would have been unaltered. The Project could have been completed by the end of 1992.

3.2.8 The early establishment of the Project was beneficial to the overall outcome as it firmly established the following:

* The required outcome/target
* The required outputs
* Timescale
* Costs

and provides a coherent focus for all work.

1-3 agree
4 no- but
We experience

3.3 DEDICATED PROJECT TEAM

3.3.1 Progress on the Project benefitted greatly from having a full time Project Manager with specified individuals on the Project Team. Much knowledge and expertise has been gained in ways of carrying out a complex contamination clean up with significant legal overtones and implications.

3.3.2 With the successful completion of the Project, this centre of excellence will be disbanded and a new team would need to formed should a new problem of a similar complexity and blend of legal issues arise.

3.3.3 Consideration should be given at National level to the formation of dedicated Project Team to cover complex pollution incidents and prosecutions on a "Flying Squad" basis. This should include an assessment of the potential work load for such a "Flying Squad" under Envage.

3.4 BEST PRACTICES IDENTIFIED

1. Establish a project immediately on the realisation that a problem exists.
2. Determine preferred legal option as soon as practicable.
3. Establish a dedicated Project Team.
4. Give consideration to setting up a permanent National "Flying Squad" team to deal with major events.

4.0 PROJECT MEMBERSHIP

4.1 PROJECT EXECUTIVE & PROJECT BOARD

4.1.1 The Project Executive was the third tier manager within whose budget the costs of the Project were authorised. This worked well and reduced the amount of reporting necessary for the project as only line management reporting required went direct through the Project Board and Project Executive.

4.1.2 As the Project was large, complex and high risk, a Project Board was appointed to assist the Project Executive. Until the appointment of the Project Manager, three months after the initiation of the Project, the Project Board functioned as a "Project Management committee". This enabled progress to be maintained without entailing undue delay.

4.1.3 The Project Board was comprised of people who had the following expertise:

* Water Quality
* Project Management
* Finance
* Legal
* Environmental Consideration

This gave a thorough coverage of the various facets of the Project whilst avoiding a bias towards any particular facet. After the appointment of the Project Manager, the Project Board continued to provide detailed and balanced advice and comment on all aspects of the Project. This added significantly to the efficiency and quality of the Project.

4.2 THE PROJECT TEAM

4.2.1 The Project Team comprised two elements:

* the external experts
* internal NRA staff

with the external experts being appointed as and when necessary to cover the legal, ecotoxicology, analysis and design. With the exception of the legal side, all external experts were appointed via the Project Manager. For discussion on the legal appointments see Section 5.6.

4.2.2 The internal NRA members of the Project Team controlled all the various elements of the Project under the overall guidance of the Project Manager. Each NRA member covered specific areas of expertise and the composition of the internal Project Team reflected the balance of the Project. This enabled the satisfactory progress and performance of the external experts to be monitored and reinforced where necessary and for control to be fully retained within the NRA.4.2.3This required spread of expertise for the internal Project Team meant that its members had to be drawn from separate and different functions within the NRA. Two important aspects which were key to the success of the Project were:-

* Team Building and Communications
* Effect on Budgets and Resource

4.2.4 With the exception of the Project Manager, no members of the internal Project Team were allocated full time to the Project. They were expected to carry out a large proportion of their normal work at the same time as supporting the Project..

4.2.5 The four NRA members of the Project Team remained at their normal places of work which resulted in the Project Team being spread over three offices. This emphasised the need for the special attention given within the Project to Team Building and Communications.

4.2.6 Meetings of the Project Team and Project Board were the main means of ensuring full and accurate communications within the Area. These meetings were held monthly and the Project Board meeting followed directly on from the Project Team meeting. Minutes of the Project Board were produced and circulated by e-mail within three working days.

4.2.7 Minutes of Project Board meetings were fully circulated to assist communications and dissemination of up to date knowledge. Communications were also improved by the Expert Witness Meetings (see Section 5 - Legal Case) and circulation of minutes from these.

4.2.8 Because of the variability and rapid changes experienced to the Project, the time requirements of individual Project Team members occasionally altered at short notice. The Project Manager maintained close communications with members' line managers. Programmes and time requirements were agreed between the Project Manager and line managers on a regular basis.

4.3 BACKUP FOR KEY MEMBERS

4.3.1 During the development of the legal aspects of the Project it was appreciated that the loss of either an expert witness or key member of the team could result in either delay to the Project and legal case or an inability to submit necessary evidence within the legal time constraints.

4.3.2 Contingency plans were drawn up to cover the loss of any key member or witness.

4.3.3 Analysis expertise was provided by Professor Hagenmaier. He was appointed on the basis of being one of the two foremost European experts on dioxin sources and analysis. The other expert was strongly believed to be employed by Coalite Chemicals and would never be available to the NRA and its legal case. It was recognised that Professor Hagenmaier could not adequately be replaced and therefore every effort was made to minimise the potential effects of his possible loss. These included having results, analysis and opinions reported in writing as soon as possible and having WRc briefed to provide support. Had the legal case been proceeded with other experts (probably from the United States) would have been approached and held in reserve. This essentail provision would have led to an increase in overall project costs.

4.3.4 The ecotoxicological expertise was provided by Dr Tony Dobbs of WRc. All work and evidence required from WRc was promptly written up in report form and papers submitted early for peer review. This ensured that potential evidence was documented and confirmed as soon as practicable. WRc were also requested to provide and keep briefed a backup for Dr Dobbs to cover any periods that he became unavailable.

4.3.5 Design expertise was provided by Ove Arup. Ove Arup is a large consulting engineering practice with a number of experts in the fields required for the Project. Their internal project team comprised a core of four:

* Director
* Project Manager
* Senior Engineer
* Engineer

with additional support as necessary. It was judged that in the event of the loss of one member, there were adequate resources within the Ove Arup organisation to replace the loss and the other team members would have sufficient overlap of detailed knowledge of the Project to enable a replacement member to be incorporated without any adverse effect. This assessment was verified when the initial Project Manager was called away to resolve a serious problem on one of his previous projects in Australia. Alternative arrangements comprising the Project Director taking a more active role with support from the Director of Ove Arup's local office resulted in no adverse effects being felt on the NRA Project.

4.3.6 On the legal side, a partner of Dibb Lupton Broomhead, the appointed Solicitors, had a watching brief and attended key meetings to provide the requisite backup.

4.3.7 Within the NRA, the loss of individuals from the Project Team and Project Board was investigated and assessed. It was concluded that only the loss of the Project Manager could produce problems and these would be of a very immediate nature.

4.3.8 Arrangements were therefore made whereby one other member of the Project Team was developed as the deputy to the Project Manager and was kept fully informed on the full details of developments. However, the deputy had limited project management experience so provision was also made for the deputy to be supported in the project management by an experienced member of the Project Board in the event of the Project Manager becoming unavailable.

4.4 RESOURCING THE PROJECT TEAM AND PROJECT BOARD

4.4.1 Both the Project Team and Project Board were constituted on a cross functional basis. Adequate provision was made within the financing of the Project to cover their costs associated with the Project.

4.4.2 However potential difficulties were identified in the shortfalls in both staff time and budget costs in the functions that the members of the Project Team and Project Board were drawn from.

4.4.3 The staff costs for the project were estimated at £95,000 in the Project Initiation Document. As this was to be met without an increase in staff numbers, there was a corresponding total decrease of £95,000 in the budgets of the functions from which project members were drawn. This effect was significant. When initiating a similar project, consideration must be given to its effects on other budgets and staff resources.

4.4.4 Given the complexity and political significance of the Project, the Project Board members had to devote appreciable amounts of time to it, especially in the early "Project Management Committee" stage. This impacted on their normal work. When initiating a similar project, consideration must be given to the effects of its management requirements senior staff resources.

4.4.5 Without an increase in staff numbers, the individual Project Team members had to ensure that their normal work load was carried out <u>in addition</u> to Project work. This was achieved by spreading their normal work our within their functions and by the working of unpaid overtime. This could have been mitigated by the use of temporary staff but training requirements may militate against this.

4.4.6 Both Project board and Project Team members were involved in significant inputs of time into the Project. Details of these were reported and agreed with their individual line managers.

Not "[illegible] Pay" — Contingency funds.

4.5 BEST PRACTICES IDENTIFIED

1. The third tier budget manager should be the Project Executive.

2. Project Board to function as "Project Management Committee" and run the Project until the Project Manager is appointed.

3. The Project Board should be comprised to provide a balanced expert backup over the range of the Project.

4. The NRA members of the Project Team should have expertise and experiences sufficient to cover all the key elements of the Project.

5. Cross functional NRA Project Team.

6. If viable, locate Project team in one office. If not, reinforce team building and communications.

7. Regular agreeing, updating and reporting of internal Project Team members time requirements with their line managers.

8. Full and prompt circulation of full Project Board meetings via e mail.

9. Assess the possible effects of any loss of key witnesses or team members and draw up contingency plans to minimise adverse effects.

10. Recognise and assess the effects of establishing the Project on the staffing and budgets of functions that Project members are drawn from.

11. Be prepared to take on support staff to cover work normally carried out by Project Team members (consider training needs).

5.0 LEGAL CASE

5.1 BACKGROUND

5.1.1 In 1992, the NRA was given expert legal advice that a criminal prosecution under Section 85 of the Water Resources Act was unlikely to succeed for the following reasons:

- wording of the consent to discharge
- difficulty in proving a link between the dioxins in the river and Coalite Chemicals
- effects on the environment of dioxins were unknown

5.1.2 During 1993 and 1994, the argument was developed that the NRA could carry out a clean up of a small section of the river to verify the possibilities and then decided whether to take a civil action under Clause 161 of the Water Resources Act against Coalite Chemicals and thereby establish responsibility on Coalite Chemicals for the remainder of any clean up.

5.1.3 The following points should be noted:

- There is nothing to preclude criminal prosecution under Section 85 and civil action under Section 161 both being pursued. Timing is irrelevant.
- Criminal prosecution relies on proof "beyond all reasonable doubt" whereas civil action relies on the lower level of proof of "on balance of probabilities".
- The proof of linkage to the polluter and effects on the environment are common to both actions.
- A proportion of the NRA costs can be recovered under civil action. The NRA may also get a proportion of its costs in a criminal prosecution

  (In the Shell case in North West Region, the case was heard by the Crown Court. The Authority asked for and got only its legal costs of approximately £6,500 but did not seek to recover any of its other costs. Out of court, Shell agreed to reimburse all properly invoiced costs. This out of court reimbursement has set no legal precedence).

5.2 CRIMINAL AND/OR CIVIL CASE

5.2.1 Both criminal and civil proceedings have advantages and disadvantages which will be unique to each particular case. It may be advisable to follow both through, as a successful Criminal case will ease the Civil case. Points to be borne in mind are:

- Relative levels of proof required.
- Civil case requires prior action by NRA which leads to increased risk of liability.
- Likelihood of the NRA being awarded its costs in the legal action
- Ability to recover from defendant any cost awarded to the NRA.

5.2.2 At the same time as considering the action to be taken against the polluting company, consideration should also be given to the desirability of taking action against named individuals from the company. This may focus attention and lead to an earlier resolution of any legal action.

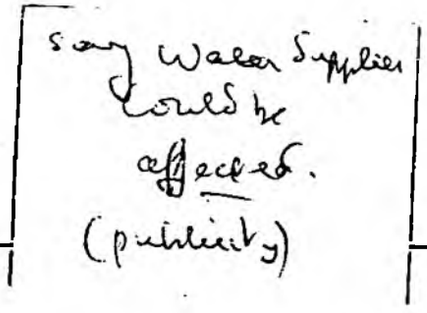
5.2.3 It is recommended that the courses of legal action available to the NRA be assessed as soon as a serious pollution event occurs and on the optimum course selected.

5.3 EFFECT OF THE ENVIRONMENTAL PROTECTION ACT

5.3.1 Under the amendment introduced by the Environment Act 1995, the Environmental Agency (Envage) will be empowered to instruct a polluter to carry out a clean up. When the dioxin contamination was discovered in the Doe Lea, the Water Resources Act 1991 was the governing legislation. Under this, the NRA had first to carry out the clean up and recharge where the polluter refuses to accept responsibility.

5.3.2 Under the new provisions, the polluter will have a right of appeal against the instruction to carry out a clean up and there could be an adverse effect on the course of the enforcement if the appeal takes so long that the pollution dissipates and can no longer be cleaned up.

5.3.3 It is recommended that this matter be clarified with expert legal advice before any action to instruct a possible polluter to carry out a clean up is instigated. Regulations still to be made by the Secretary of State may provide for whether work is to continue pending a decision on the appeal.



5.4 DEVELOP SECTION 161 ACTION WITH CLEAN UP OR AFTER

5.4.1 As originally envisaged, the Project was to have developed the legal case after carrying out the clean up. During the assessment of the requirements for the clean up it became obvious that the requirements for the legal case made it essential that the two were developed in parallel.

5.4.2 Specific examples of the need for parallel development were:

- Location and number of samples.
- Acceptability of methods of taking samples and advice on the evidentiary requirements for sampling.
- Likelihood of consultants and contractors engaged in any clean up being required as expert witnesses.
- Recording of decisions and costs.
- Need to preserve the legal confidentiality of much of the work.
- Development of expert witness testimony.

5.4.3 Failure to develop the legal case in parallel with the clean up its likelihood of success may be fatal to the success of the legal case. There will also be a much greater time between the initial pollution and the case coming to court.

5.5 CONTROL OF EXPERT WITNESSES

5.5.1. Under the Project, the day to day control of the two expert witnesses on sampling/analysis and effect of dioxins was passed directly to the external Solicitors. Clear written guidelines were given to the Solicitors on the following points:

- Progress reports.
- Financial monitoring and budget ceilings
- Copying of correspondence to the Project Manager

5.5.2 This arrangement had the following advantages:

- There was much clearer and precise communications between the Counsel appointed to represent the NRA and the expert witnesses he was to lead.
- Time delays and hence costs were kept to a minimum.
- It produced a more robust legal case.

5.6 CONTROL OF SOLICITORS

5.6.1 It has been normal practice for external solicitors to be appointed and instructed by the NRA's legal sections. This system complies fully with the NRA's Scheme of Delegation.

5.6.2 In complex litigation, it essential to build a closely knit team with accurate and rapid communications between the individual team members. This enables the development of the most robust legal case. For the legal aspects of the project, the key members were:-

- The Project Manager.
- The NRA in-house lawyer.
- The external Solicitors.
- The external Queen's Counsel.

5.6.3 It was an advantage on this project for the Project Manager to be able to issue instructions to and take direct advice from the external Solicitors and Queen's Counsel in consultation where necessary with in-house solicitors. The advantage of this arrangement was to avoid unnecessary delays and breakdown or inaccuracy in communications. This process was facilitated by having a member of the NRA's legal section on the Project Team.

5.6.4 In order to derive the maximum benefit from the expertise of the external Solicitors and Queen's Counsel, great care was taken by both the Project Manager and internal lawyer to avoid interpreting external advice, leading or unduly influencing the external advice or issuing duplicated or contradictory instructions to the external legal experts.

5.6.5 The balance of the roles taken by the Project Manager and internal lawyer on the Project Team was determined by the experience and legal understanding of the Project Manager. The speed and effectiveness of the legal case will be enhanced by giving the maximum freedom to the Project Managers consistent with their expertise and experience.

5.6.6 It is vital to the success of the legal case that the Project Manager is always in a position to fully appreciate the legal options and arguments being put forward as well as appreciating the financial impacts of obtaining the legal advice and of the financial implications of that advice. If the Project Manager has enough expertise, this can be achieved by direct communication and instructions from the Project manager to the external Solicitor. If not, support will be required from the internal NRA legal section and this may be required on very short notice.

5.6.7 It is recommended that, in projects like the Doe Lea Restoration Study, consideration is given to having the appropriate levels of direct control by the Project Manager of the external Solicitors involved on the project.

5.7 EXPERT WITNESS MEETINGS

5.7.1 A feature of the project was the regular meetings of the legal representatives, expert witnesses and Project Manager. The meetings discussed the strengths and weaknesses of the overall case, the need for additional evidential work and individual experts testimony.

5.7.2 The exchange of ideas at the meetings combined with the drawing together of the team and its evidence greatly strengthened the legal case being prepared. The meetings also ensured that there was a common base of knowledge across the members of the Project Team.

5.7.3 Inviting selected outsiders (Project Executive and Head Office representatives) to the expert witness meetings improved the monitoring of Project progress and facilitated the briefing of line management and the NRA National Board.

5.8 LEGAL COSTS AND BUDGETS

5.8.1 As the Project developed, it became clear that if a legal case were proceeded with, the legal and witness costs would form the great majority of the budget.

5.8.2 The Solicitors were required by the Project Manager to make an assessment of these costs for various stages of the legal case. This they were happy to do and it enabled an accurate overall assessment of the NRA'S financial liability to be made.

5.8.3 If the NRA had won the case, it could also have recovered its costs. However, these costs would have been "taxed" i.e.., assessed by the courts to determine their reasonableness. Indications from solicitors and barristers are that only between 60% and 75% of costs are normally recovered. Thus, even if totally successful the NRA would have been faced with significant costs (ie the remaining 25% to 40% of NRA costs not recovered). See also section 7.7 - Legal Costs

5.8.4 Had the NRA lost, it would have had to bear the great majority of the defendants costs. Under the Project, an assessment was made of the likely scale of these. The comments made on the taxation of costs in 5.8.3 apply equally to the defendants costs.

5.8.5 The Project demonstrated that:

- A complex legal case with supporting evidence can be developed within and in compliance with the NRA's Project Management Guidelines.
- The quality of the legal case benefitted from the application of project managements methods.

5.9 BEST PRACTICES IDENTIFIED

1. Assess legal options as soon as possible
2. Clarify legal position of the "polluter cleans up" clause in the new Environmental Protection Act.
3. Develop the legal case at the same time as any clean up.
4. Pass day to day control of expert witnesses to Solicitors if beneficial to the case.
5. Consider direct contact and instructions to the external Solicitors by the Project Manager.
6. Hold regular expert witness meetings.
7. Assess legal costs for preparing legal case and for going to court as soon as practicable and review when significant changes to the Project occur.
8. Assess level of costs due if NRA wins or loses the legal case.
9 Apply project management methods and controls to important legal cases.

6.0 COMMUNICATIONS

6.1 GENERAL

6.1.1 The Project was high profile and politically sensitive with great interest and concern shown at both Regional and National level. Department of the Environment, MEPs, MPs, local authorities and national pressure groups, notably Friends of the Earth and Greenpeace, also took a very close interest in the Project.

6.1.2 Once established, the Project developed rapidly and was also subject to two major changes. The first was when dioxin levels were found in March 1995 to have decreased by over 95% and the second was the decision in June 1995 to pursue the natural clean up with no legal case option.

6.1.3 It was essential for the success of the Project that information be rapidly and accurately communicated so that the correct authorisations and support were given to the Project and that all tiers of the NRA were kept fully informed. Wherever possible, duplication of information paths was avoided and common reports or abstracts from common reports were used for communication.

6.2 REPORTING LINES

6.2.1 The following reporting hierarchy was developed and adhered to:

1) Project Board (with the Project Executive)
2) Regional General Manager
3) National Directors
4) National Board

The Regional Management Team, Regional Rivers Advisory Committee and Regional Advisory Board were also kept informed and up to date via separate reporting.

6.2.2 The Project Board minutes were the prime means of communication at Area level and were circulated to the Project Board, NRA Project Team members and the Area Manager. Position papers and Project Proposal papers prepared for submission to Region and National Directors were circulated first to the Project Board and approved by them.

6.2.3 Because of the rapid developments within the Project, it was not possible to fit in with timetable requirements for papers to Operations Managers Group and the National Board which call for papers to be in place up to four weeks in advance. Instead the Regional General Manager was fully briefed immediately prior to each National Board meeting.

6.2.4 Accordingly, the Project Board meetings were set for the Tuesday immediately preceding each National Board meeting and the papers for and briefing to the Regional General Manager agreed.

6.3 DoE COMMUNICATIONS

6.3.1 All communications with the European Commission concerning dioxins go through NRA Head Office to the Department of the Environment who then respond to the European Commission.

6.3.2 The Department of the Environment were presenting the Project to the European Commission as an example of where the UK was reducing the dioxin inputs into the North Sea in order to comply with European Commission directives. When the decision to follow the natural clean up/no legal case option was reached, this was a significant change of direction.

6.3.3 The potential for adverse criticisms of the United Kingdom by the European Commission for this change of direction was resolved by the Department of the Environment and Project through a swift response with justifications to the Department of the Environment. However, this potential would not have arisen had the Project been fully aware of the Department of the Environment's interest and lines of argument with the European Commission.

6.4 FILING

6.4.1 One of the main outputs envisaged for the Project was a successful legal case against the polluter. In any such case, all documentation is "discoverable" i.e., must be made available to the polluter. Failure to disclose the relevant documents would seriously undermine any legal case.

6.4.2 All relevant documents prior to the start of the Project were drawn together, indexed and photocopied with the copies being lodged with the external Solicitors.

6.4.3 All files started under the Project were opened with a form stating that they were prepared in anticipation of legal action. This would have prevented them from discovery by the polluter during the anticipated legal action.

6.4.4 It should be noted that had the case gone to trial it would have been necessary to photocopy all files in order to maintain working copies within the office for the duration of the trial period, which from initial hearing to final decision could have been over one year.

6.5 BEST PRACTICES IDENTIFIED

1) Single line hierarchical reporting using common reports. Project Board minutes to be used as the basis for these.

2) On a rapidly varying Project, monthly briefings of the Regional General Manager immediately prior to National Board meetings.

3) Ensure that there is full awareness of national and international implications and Department of the Environment's needs and reasons for information.

4) Collate and index all relevant files and documentation.

7.0 NRA LIABILITIES

7.1 BACKGROUND

7.1.1 Under the Project, the NRA was contemplating carrying out a small scale clean up of the dioxins and a recovery of cost from the polluter via legal action. This course would have established the following legal liabilities on the polluter:-

* to carry out the remainder of the clean up of the dioxins from the river.

* responsibility for any damage or harm arising from the dioxins in the river

7.1.2 Any clean up with its potential for disturbance of the dioxins would have laid the NRA open to action against it over the effects of dioxin pollution. Such action was already being contemplated by several parties against the original polluter. The NRA may have been joined into these actions.

7.1.3 The potential liability to the NRA was a minimum of £5,000,000, with ceiling and most likely figure in the tens of millions.

7.1.4 There was a possibility that legal action may be taken against the NRA by third parties claiming to be affected by dioxins.

7.1.5 There was a much smaller possibility that this legal action would be successful.

7.1.6 As the NRA pursued the natural clean up of the river with no disturbance of the dioxin contamination within the sediments, there was no potential for legal action. However the legal advice and general experience gained on the Project, give valuable indications and lessons for any future action.

7.1.7 Although the NRA can only take action on pollution arising out of its potential for harming or preventing the recovery of the aquatic environment, legal action against the NRA is most likely to arise out of the effects on humans.

7.1.8 The known effects of dioxins and many other potential pollutants on humans are cumulative and long term. They include skin disorders, cancers and potential genetic effects. It is possible that effects may not become manifest for several years. The recent report from the Environmental Protection Agency of the USA recommends a zero level for human contact with dioxins. This is however, not universally accepted.

7.2 POTENTIAL FOR LEGAL ACTION AGAINST THE NRA

7.2.1 The NRA would only become liable for action against it if it went ahead with the clean up of any part of the river.

7.2.2 The action would be most likely to be initiated by either people who display symptoms which could be attributed to dioxins, or by land owners or water users whose interests (e.g. development) have been adversely affected.

7.2.3 There are three main sources for legal action against the NRA:-

1. An accident during the clean up, causing a release of dioxins into the environment

Even if there is no evidence that the NRA caused a release of dioxins, there are two further circumstances in which a legal action may be brought against the NRA.

2. The NRA is joined into a legal action against the company who caused the original pollution.

3. The polluter ceases to exist, leaving the people pursuing the legal action with only the NRA to take action against.

The second and third sources are the most likely.

7.2.4 In the second, the joined action, the prime target of the action would be the polluter. However, the NRA and most probably the Consultant designing and supervising the clean up and the Removal Contractor would also be sued. The purpose behind this would be to make the NRA, the Consultant and the Removal Contractor do most of the litigant's work for them by providing a defence by showing the polluter was the main or only source of the dioxins. This is an increasingly popular method of attack in legal action.

7.2.5 In the third source, legal action could be instituted against the polluter on such a scale that the easiest way for the parent holding company to defend its assets would be to put the polluter into liquidation or withdraw from the UK. Litigants would then be look to seek a replacement defendant in order to get any recompense. The NRA would be the only viable alternative.

7.2.6 Matters are compounded by the general perception that local authorities are viewed as soft targets in legal actions and liable to make favourable out of court settlements.

7.3 POTENTIAL NRA LIABILITY

7.3.1 If, following a clean up of contamination, a legal case were to be pursued against the NRA, it is likely that it would be heard in the High Court with appeals onto the House of Lords. Any case would involve much use of expert witnesses and reviews of causes, actions and effects. Based on recent arbitration cases and the estimated expert witness fees for the legal action for recovery of costs, NRA costs will be a minimum of £2,000,000 , with the other side's costs being of the same order. Even if the NRA were successful in its defence of the case, it may still have to bear its own costs. See Section 7.7 - Legal Costs.

7.3.2 Minimum total cost to the Authority in the event of the Authority being found liable was estimated to be in the order of £5,000,000 excluding damages. Damages depend on the number of people affected and on the severity of effects. Damage awards are also increasing. A prudent current estimate would be £2,000,000 per person. Trends in awards over the past years have shown a continued increase and there is no reason to doubt that this upward trend will continue. However, the rate of future increase is uncertain.

7.3.3 Maximum total liability could well be into tens of millions of pounds.

7.3.4 Under the Project assessments of all liabilities were made and reported to the Project Board, Regional General Manager and National Board and Directors.

7.4 ASSESSMENT OF SUCCESSFUL ACTION AGAINST THE NRA

7.4.1 The main foreseeable lines of NRA defence against a legal action were:-

* The source of the dioxin was the polluter, not the NRA.

* The dioxins which affected the litigant came from the air or surrounding land, rather than the river.

The first line is very strong. Congener profiles strengthen this argument for the NRA. The second line is strong as the air/land route can easily be shown to contribute to the bulk of any dioxin dose received. However, the river route may be found to be partially responsible. In this event, the defence is not total.

7.4.2 Against claims for affected land on the flood plain or contamination of river sediments, some reliance could be placed on other dioxins within the system which were not touched by NRA work.

7.4.3 On the Project, five sets of persons or companies were known to be contemplating action against the perceived polluter. This increased the potential for the NRA to be drawn into a legal action had it carried out any work on the clean up.

7.5 MINIMISATION OF OVERALL NRA RISK AND LIABILITY

7.5.1 As promoter of any clean up contract, the NRA will carry ultimate responsibility and hence liability for successful claims arising from the effects of the contract and the actions of any person or company that the NRA employs in connection with the works.

7.5.2 The Project sought to minimise the harmful effects and hence overall liability by the following measures:-

* Employing only expert consultants and contractors.
* Ensuring that full risk assessment would be carried out on the options and working methods.
* Ensuring that the works are carried out in the safest practicable manner.

However, even had these measures been carried out, there would still be a finite risk of an accident occurring and valid legal claims being made against the NRA.

7.6 PASSING OF LIABILITY TO THE CONSULTING ENGINEER AND CONTRACTOR

7.6.1 Under the Project, the NRA sought to reduce its financial liability by passing some of the liability to the Consultant and the Removal Contractor through the NRA's contracts with them. In turn, they were expected to pass some liability onto their respective insurance companies.

7.6.2 The Contract with the Consultant contained a Professional Insurance limit of £2,000,000. Of the three Consulting Engineers invited to tender, this was the highest limit which any would accept.

7.6.3 Enquiries from within the insurance industry show that there is an increasing reluctance to provide any cover in relation to contaminated land and especially where dioxins are encountered. This trend could leave both Consultant and the Removal Contractor without effective insurance cover at some point in the future and so reduce the NRA's coverage.

7.6.4 Insurance matters are covered in detail in Section 8

7.7 LEGAL COSTS

7.7.1 Had the NRA lost the civil legal case against the polluter, it may then have become liable for the polluter's costs in defending the case. These costs would have been of a similar magnitude to those envisaged for the NRA i.e. £1,000,000 to £1,500,000. These costs would increase if the case went on to appeal.

7.7.2 Similarly, if the NRA won the case, its costs may be borne by the polluter. This leads to speculation as to how the influx of such a large sum of money could be accommodated within existing budgets without undue effect.

7.7.3 All awards of costs can be subject to "taxation". This is a process whereby the individual costs are scrutinised by the courts who then assess what costs are reasonable to award against the party which loses the legal action. Experience of the solicitors and barristers on this Project indicates that normally only 60-70% of total costs are recovered even in a completely successful legal action.

7.7.4 In the Project, the following parameters were being assessed for their effects on the overall estimated cost of the Project to the NRA:-

* Settling the case prior to any court action.
* The NRA winning the case outright.
* The polluter winning the case outright.
* Taxation of costs after the determination of the legal case.

7.8 POSSIBLE NRA LONG TERM LIABILITY FOR CLEAN UP

7.8.1 Throughout the Project, it was appreciated that there was the potential for the NRA to take over responsibility for the clean up from the polluter by the very act of the NRA carrying out any initial clean up. The public relations aspects of this are covered in Section 11.

7.8.2 The liability for the NRA carrying out future clean ups would have been increased significantly under the following conditions:-

* The NRA lost any legal case.
* The polluter went into liquidation (perhaps as a direct result of legal action)

7.9 BEST PRACTICES IDENTIFIED

1. Assess potential for legal action by third parties against NRA over any clean up.
2. Assess probability of NRA being joined into defending a legal action with the polluter.
3. Assess scale of liabilities and include as background to project authorisation.
4. Minimise risk by adjusting project and passing on liabilities via insurance.
5 Assess effects of defendants costs.
6. Assess the potential effects of taxation of both NRA and defendants costs.
7. Avoid taking on responsibility for further clean ups.

8.0 INSURANCES

8.1 GENERAL

8.1.1 Throughout the Project, efforts were made to protect the NRA's position by obtaining insurance cover for the perceived risks. The NRA, being an authority controlled by Government instructions and requirements on financial matters, is not permitted to obtain outside insurance but instead is expected to self insure.

8.1.2 It was a guiding parameter throughout the Project that the NRA's exposure to the risk of future claims against it arising out of the effect of dioxin contamination should be minimised. Where practicable, this would be achieved in part by ensuring that liabilities were passed on to the outside consultants and contractors employed by the NRA. In turn, it was expected that the outside consultants and contractors would cover their risks through insurance.

8.1.3 A case was also prepared for submission to the Department of the Environment seeking exemption from the general rule on self insurance. The argument developed was that as the NRA would seek to recover costs from the polluter under Section 161 of the Water Resources Act, the following logic and course of action could be applied:

* The NRA would notify the polluter of the need to carry out the removal or remediation of the dioxin and request that the polluter carried this out.

* If the polluter refused, the NRA would carry out the work and seek to reclaim the costs under Section 161.

* Therefore, the NRA was acting in lieu of the polluter and was entitled to incur reasonable costs.

* If the polluter carried out the work it would be reasonable to expect that the polluter would obtain insurance cover. Hence insurance costs are a reasonable part of the remediation.

* As responsibility would be established on the polluter under the Section 161 recovery of cost action, it was reasonable for the NRA to obtain insurance to protect the polluter from any future costs caused by the remediation.

8.1.4 In short if the polluter were carrying out the clean up themselves they would obtain insurance. As the NRA would be acting for them and recharging, it is reasonable for the NRA to attempt to obtain insurance.

8.1.5 This argument was put to and agreed by NRA Head Office but because of the non availability of specific insurance (see section 8.2.3) was not pursued with the Department of the Environment.

8.2 EFFECT OF CONTAMINATED LAND

8.2.1 Insurance against claims arising from contaminated land is currently viewed with great uncertainty by the insurance industry. There are few examples of resolved claims and case law to establish legal liabilities is being rapidly changed and developed. It is therefore difficult for the insurance industry to assess the risks that they would be carrying and to set a sensible premium.

8.2.2 Public perception that the risks of contaminated land are increasing coupled with the much greater willingness to take legal action, add to the insurance industry's uncertainty.

8.2.3 Independent brokers were approached about the possibility of obtaining a one-off insurance for the NRA to cover the risks associated with the Project. Their advice was that this would be unobtainable for the following reasons:

* Cover for this type of risk is not normally available in isolation - insurers consider this to be selection against themselves.

* The project was such that insurers would probably not wish to provide cover anyway.

* Even if cover was available, limits offered would be comparatively low and costs almost certainly prohibitive. The best offer for the Authority's Public Liability insurance (prior to its cancellation) some two years ago was with an upper limit for liability of £5,000,000, a premium £1,000,000 and an excess £1,000,000.

* Where there is a risk of pollution/contamination Insurers normally exclude all such cover. At best if cover is available it only applies in respect of "sudden, unexpected and accidental" pollution i.e. specific incident and not gradual.

* There is a specific environmental impairment liability cover available from the specialised insurance market but cover is difficult to obtain, detailed surveys are required, there are low limits for liability (£1,000,000 to £5,000,000 maximum) and the costs of providing the cover are very expensive. Such cover would not be available for the Project because of the specific nature of the Project.

8.2.5 The conclusion was that the only insurance available to the NRA on the Project was through the consultant and contractors and their insurers.

8.3 CONSULTANT AND CONTRACTOR INSURANCES

8.3.1 Insurance to be provided to the NRA by consultants and contractors is prescribed and agreed in the relevant Conditions of Contract. All industry standard Conditions of Contract set limits on the liability that the employer (the NRA) can pass onto the consultant or contractor. These limits have to be specified and agreed before any contract is entered into.

8.3.2 In order to avoid very complex and costly legal situation arising over doubts and interpretations on the divisions of liabilities and responsibilities should a claim arise against the NRA out the Project, it was essential that all parties to contracts concerned with the Project were fully and clearly aware of the full extent of the liabilities they are taking on. This includes type and cause of the liability and the ceiling value of the liabilities (including legal costs).

8.3.3 Preliminary interviews were held with five consultants. During the interview, the liabilities were outlined and limits of liability of £1,000,000 to £5,000,000 were indicated. It was axiomatic that, if the consultant were expert enough on the matters of dealing with contamination to satisfy the NRA and be included in the Tender List, they would also be experienced enough to fully appreciate the risks and insurance implications. This was verified at the pre-tender interviews but confirmation of insurances being in place was not sought at this point.

8.3.4 The insurance provisions of the brief were discussed and agreed with an outside legal expert. Two options were available to the NRA.

Single Liability Limit

In this option, a single limit is requested in advance by the NRA and the consultants and contactors price against this. It is for the NRA to assess what is most economically advantageous level to choose and assess what limit is acceptable to firms and will not result in them declining to tender because the limit is too high. From knowledge at the time, a liability limit of between £5,000,000 and £10,000,000 for the Project was thought to be the maximum acceptable. It was likely that the prices submitted by the consultants and contractors accepting this scale of liability would form a significant proportion of their costs.

Multiple Liability Limits

In this option, the consultants and contractors are requested to price a range of liability limits (suggested between £1,000,000 and £20,000,000). They are permitted to decline to price for the higher limits if they so wished without prejudicing the remainder of their tender. It is made clear that assessment of their quotations includes, consideration of the level and cost of providing the liability limit.

The multiple liability option was selected for the tendering process. The multiple liability option had the advantage of allowing the NRA to more accurately assess the cost of providing the various degrees of protection against future legal action and to determine the optimum economic and political levels.

8.3.5 The following points became clear from further discussions with the tendering consultants:

* The provision of insurance when compared with the estimated cost for carrying out the commission (£50,000 - £100,000) was extremely high. One consultant withdrew commenting that the major part of the work was the provision of the insurance, not the design of remedial work.

* All the consultants' insurance brokers were very cautious and wary of the project intentions and potential risks.

* The NRA would be unable to pass on more than a small part of the overall liability for a major claim to the successful consultant.

* The consultants representatives at the pre-tender interview were not the consultant's experts on insurance and this had coloured their replies. Also, as they were applying to tender, their replies were more optimistic and positive rather than realistic.

8.3.6 At tender, limits of liability of £1,000,000, £5,000,000, £10,000,000 and £20,000,000 were offered by the NRA. Only one consultant returned a tender unqualified on insurance matters. This tender offered cover of £2,000,000 but this was an aggregate sum rather than a sum for each individual occurrence as required in the tender documents. Proof of insurances were not requested at tender stage.

8.3.7 Discussions with the Consultant after their appointment indicated that the tender had not been discussed with either their internal legal department nor insurance brokers. This created difficulties for the Consultant in fulfilling the Contract requirements.

8.4 NRA STANDARD CONDITIONS

8.4.1 After the appointment of the successful consultant, it became clear that their insurance brokers were having difficulty accepting some of the more detailed provisions.

8.4.2 As a precautionary measure, the Project investigated the possibility of involving Clause 21.2 paragraph 3 of the NRA Terms of Appointment. This states:

> "In the event of default by the Consulting Engineer in effecting or maintaining such insurances, the NRA may effect and maintain such insurances and shall be entitled to cover the costs ..... "

8.4.3 However, because of the reasons detailed in 6.1.1 and 6.2.3, the NRA was unable to obtain any insurance and therefore Clause 21.2 was unenforceable. This has the far wider implication that should a consultant or contractor default on the insurance provisions of a contract, the NRA's only options are:

* To terminate the contract completely on the grounds of Breach of Contract and then seek damages by legal action. This is an extremely serious step to take as all contractors wish to avoid the stigma of losing such an action.

* Accept that the NRA is uninsured.

8.5 BEST PRACTICES IDENTIFIED

1. Identify insurance sensitive commissions before appointing consultants or contractors to a project.

2. Request proof of adequate insurance cover at pre-tender interviews.

3. Consider offering a range of liability limits for tender.

4. Make it clear that insurance provisions will be a criterion used for assessing tenders.

5. Review Clause 21 of the NRA Terms of Appointment.

6. Do not seek one-off insurances for high risk projects. They are unlikely to be available.

7. Assess what proportion of the appointment is for the provision of insurance. Determine if this is reasonable.

8. Use insurance reluctance as a trigger to review project liabilities and risks.

9. Obtain expert opinion on insurance provisions.

10 Ensure that the Consultant fully appreciates the insurance implications and has received expert advice.

9.0 SAMPLING

9.1 GENERAL

9.1.1 The Project was reliant for any legal case on accurate representative samples being taken from the sediments of the river bed. Because of the existing state of the law and rulings on admissibility of evidence, the splitting of samples into three parts with one part being given to the believed polluter was essential. This requirement to "tripartite" samples is not required under the new Environment Act 1995 but taking of backup samples may be judged prudent in complex cases.

9.1.2 The levels of proof required under the Project were for a civil case and rested on "a balance of probabilities or likelihood". It should be noted that for a criminal prosecution the level of proof required would be "beyond all reasonable doubt". This is a far more onerous test.

9.1.3 Comment on legal requirements made in this section rely solely on legal advice given to the NRA and have not been tested in court.

9.2 SAMPLE METHODOLOGY

9.2.1 Legal advice received was that the NRA was considered to be an "expert" in sampling and that all samples must be taken by an experienced officer with all procedures being videoed. For the cored sampling that would have been required had the clean up operation been proceeded with, an "expert" outside contractor was acceptable but the Contractor must be observed by an experienced NRA sampler.

9.2.2 Wherever possible tried and documented methods must be used. No standard methodology for surface sampling of sediments was available at the start of the Project either within the NRA or from outside bodies. A standard NRA methodology has been developed under the Project and is now available for general usage.

9.3 TRIPARTITING SAMPLES

9.3.1 The tripartiting of surface sediments is relatively easy. It consists of placing the material obtained in a bowl, mixing and then splitting into three equal parts.

9.3.2 Tripartiting of cored samples taken at some depth below the surface is far more problematic. Areas of concern identified by the legal experts were:

a) It is uncertain if three separate cores taken in very close proximity could be considered as one sample to be tripartited by using each core as a separate element of the overall sample to be tripartited.

b) Would cores have to be split lengthways in order to be considered as properly tripartited?

c) If only one section of the core was required for testing and tripartited, what is the status of the rest of the core?

d) Tripartiting a large core may be achieved by pushing smaller cores through it.

e) Could selecting a certain section of the core make the sample unrepresentative leading to questions in court as to why particular section was chosen?

9.4 SAMPLES TO BE REPRESENTATIVE OF RIVER

9.4.1 In order to establish the true levels of contamination and also the reasonableness of any legal case, it is essential that samples taken are truly representative of the river.

9.4.2 Dioxins and many other organic chemicals preferentially adhere to sediments rather than dissolving in water. Their concentration on the sediments is affected both by the sediment particle size and organic carbon content (perhaps also by the inorganic carbon content - this is unproven).

9.4.3 Samples taken prior to the establishment were neither sieved to determine the proportions of particle size not was the organic carbon content analysed. As individual samples may vary greatly in these two parameters, it is probable that the dioxin levels recorded either from year to year or location to location could not be compared with any degree of confidence of the accuracy of this approach. One sample taken in the Project was sieved and all had their organic carbon content analysed.

9.4.4 It must be noted that the organic carbon content also effects what level of sediment adhering contaminant may be expected in any overlying water.

9.4.5 The study length of the Doe Lea did not contain large amounts of sediments and what sediment there was concentrated at known points. This has the advantage of giving repeat data at established points but refer to comments in Section 9.4.3. In a legal case however, it could be argued that the NRA had shown a preference for particular locations and that these locations were not representative of the river as a whole.

9.4.6 Within deposits of sediment, the particle size distribution varies quite greatly. For example, at the upstream head of a sediment bed, the particles will be larger and coarser whereas at the downstream tail they will be much finer. If there is a possibility of a particle size/contaminant concentration relationship as outlined in 9.4.2, samples from the two ends will give markedly different levels of contaminant concentration. This effect needs to be taken account of when drawing up a sampling programme.

9.5 SAMPLING FOR OTHER CONTAMINANTS

9.5.1 Although the perceived problem and sole reason for action on the Doe Lea was the presence of dioxins, other contaminants were also present. These included polyaromatic hydrocarbons, phenols and other complex organic chemicals.

9.5.2 Before any removal or treatment of the sediments for dioxin contamination could be actioned, the other contaminants had to be determined for two reasons:

* To design safe systems of work as required by the Health & Safety at Work Regulations and Construction (Design and Management) Regulations.

* To obtain the necessary permits and licences for any disposal of the contaminated sediments.

9.5.3 It is more economic to have all samples taken at the one time rather than make repeat visits to obtain separate samples for each contaminant. These additional sampling requirements were built into the sampling programme drawn up for the Project prior to carrying out any work on the sediments.

9.6 SAMPLE ARCHIVE AND STORING OF SAMPLES

9.6.1 It would have been of great assistance to the Project to have been able to return to and re-analyse previous samples (especially particle size and organic carbon content). This was impossible for two reasons:

* Unused portions of untripartited samples had been disposed of after sampling.

* Using the untested portion of tripartite samples would have destroyed their tripartite status and render all results (past and present) from them legally inadmissible.

9.6.2 As a legal case is developed, new evidence may be discovered by the NRA or presented as a defence by the polluter. Retesting or testing for different compounds or properties may be the only way to resolve these.

9.6.3 The above difficulties can be circumvented by a sample archive whereby unused portions of samples were retained and stored. To obtain enough sample material to achieve this may mean larger initial samples being taken.

9.6.4 For any sample archive or for a legal case which with appeals may last two or more years, it is essential to have adequate storage facilities. This applies both in storage volume and storage conditions where samples and/or their contaminants may degrade with time.

9.6.5 Samples must be secure and easily retrievable in storage. Risk of degradation, cross contamination or loss must be minimised. For this Project, all the untested portions of the tripartite samples are kept in scaled marked jars, in one clearly marked and sealed box in a storage refrigerator. Tripartite portions of samples taken prior to the Project were also included. However, some of these samples could not be located and hence the results from them would now be inadmissible in any legal case if challenged by the defendant.

9.7 APPLICABILITY TO OTHER SEDIMENT BORNE CONTAMINANTS

9.7.1 All the best practices identified on this Project on dioxins are applicable to other sediment borne contaminants.

9.8 BEST PRACTICES IDENTIFIED

1. Use only experienced samplers.

2. Use NRA standard methodology for obtaining samples.

3. Tripartiting of cored sediment samples is problematic and case law is uncertain.

4. For contaminants adhering to sediment particles, consideration should be given to sieving samples before analysis in order to obtain the particle size/contaminant relationship.

5. For contaminants adhering to sediment particles, consideration should be given to analysing for organic carbon content and its effect on contaminant levels.

6. Take more frequent particle size and organic carbon samples (which are relatively inexpensive) to build up a more accurate picture of the overall sediment in the river.

7. For long term monitoring, use identifiable repeat locations.

8. Assess what sampling programme would be considered as being representative of the river.

9. Other contaminants must be tested for and assessed before removal or treatment of the sediments is actioned.

10. Consider setting up a sample archive to enable past samples to retested.

11. Ensure samples are stored securely and safely.

10.0 WHAT IF SCENARIOS/ALTERNATIVE STRATEGIES

10.1 NEED

10.1.1 Early on in the Project, it was recognised that particular circumstances and results could arise which would require the direction and/or timetable of the overall Project to be altered. Given the nature of the Project, such changes could be significant in terms of time, costs and NRA liability.

10.1.2 A methodology was developed to identify potential problems in advance, prepare outline strategies for meeting them and so minimise any adverse effects and maximise new benefits.

10.1.3 The purposes of this methodology was to ensure that the management of the Project remained pro-active rather than become reactive and that the best alternative strategy was pursued rather than the first identified viable strategy.

10.2 METHODOLOGY

10.2.1 When potential circumstances or results are identified that may significantly effect the outcome, progress or cost of the Project, these are initially assessed and strategies identified which would minimise effects and/or maximise new opportunities and benefits.

10.2.2 These are carried out on a standard form which identifies the following parameters:

a) The variation or change.
b) Likely timing of the variation.
c) Likelihood of the variation occurring.
d) The effect on the Project as originally envisaged.
e) Best strategy for dealing with the variation.
f) Other strategies considered.
g) Cost implications of the best strategy
h) Delay implications of the best strategy.
i) Internal NRA implications.
j) External implications
k) Public Relations requirements to explain and justify variation to the public, pressure groups and local authorities.

10.2.3 To streamline the process and avoid undue time being expended on unlikely or low effect variations, only those variations which a medium to high likelihood of occurrence coupled with a likely time of occurrence within the next four months would be subject to detailed review.

10.2.4 More detailed review may involve contingency planning, installation of further safeguards or alteration of the scope or direction of the Project to reduce the likelihood of occurrence.

10.2.5 Given the approximate nature of the approach, the following variables were used:

* Likelihood - Low, Medium, High
* Costs only assessed where likely to exceed £5,000
* Delay to the Project only assessed if likely to exceed two weeks.

10.3 REVIEW

10.3.1 The possible variations are reviewed monthly to verify or amend their categorisation.

10.3.2 When possible variations move into the detailed review category (e.g., as time of occurrence moves forward into the four month zone) they are reviewed in detail and subject to a more rigorous reassessment.

10.3.3 When possible variations can no longer occur, i.e. when the phase of the Project that they could affect is satisfactorily completed, they are signed off and removed from the system.

10.4 DOCUMENTATION AND REPORTING

10.4.1 The assessment forms are kept together in one document file. This document contains all the original assessments together with amended assessments and variations that have been signed off as being no longer possible.

10.4.2 The document is live and is updated as and when required. It is to be reported to the Project Board at each monthly meeting. This report is to include:

* New variations identified.
* Variations which have moved into the detailed review category.
* Variations that have been signed off.

10.5 DEVELOPMENT

10.5.1 Work on the alternative strategies document started with a joint meeting of the Project Board, internal Project Team and outside experts for legal and design. This meeting had three benefits:

* Ideas were fully developed using all the branches of expertise available.
* Team building
* It encouraged investigation of solutions rather than identification of problems.

10.5.2 The Project Manager developed a small number of the variations using the standard format developed. These and a covering letter detailing further information found to be necessary at the meeting were circulated.

10.5.3 The decision to pursue a natural clean up with no work in the river was taken in June 1995. The methodology was not developed further after this point. It is recommended that there is development of the methodology on other projects.

10.6 SUCCESSES

10.6.1 Both of the two major variations experienced on the Project were anticipated using this method. These were:-

* The discovery that the March '95 samples showed very great reductions in dioxin levels to the point where their effects were becoming marginal.
* The need to follow the natural clean up method of recovery.

10.6.2 As these variations had been anticipated and planned for in advance, changes to the direction and purpose of the Project were implemented with maximum benefits.

10.6.3 During the discussions on possible variations and the development of strategies to deal with these variations, the need to strengthen many aspects of the Project and legal case were identified. These included:

* Clarification of what constituted acceptable threshold levels.
* Contamination of the flood plain.
* Impact of sampling methods.
* The effect of other contaminants on both processes and any legal case.

10.7 BEST PRACTICES IDENTIFIED

1) Establish a defined methodology for looking at possible variations and planning for them.

2) Include all Project Team members in the process.

3) Detailed monitoring and recording of the variations and alternative strategies.

4) Identify and concentrate on major variations.

11.0 PUBLIC RELATIONS

11.1 BACKGROUND

11.1.1 From the outset of the Project it was appreciated, that because of the high profile of the dioxin problem both at a local and national level, transmitting the Projects objectives and methods to the public and media was vital to the Projects' success. For convenience sake all aspects concerned with these points are referred to as Public Relations.

11.1.2 At the start of the Project, a brief for Public Relations and Public Relations Objectives for the project were drawn up and agreed between the Project Executive and Public Relations Department. These defined both the role and duties of Public Relations within the Project.

11.1.3 An outline strategy document and timetable was then drawn up and agreed between the Project Manager and Public Relations Department. A member of Public Relations Department was appointed to the Project Team.

11.1.4 The first Public Meeting was held in May 1995 after the results of the analysis of the sediment samples were known. Its purposes was to give the results and to outline the Projects intention to investigate ways of making the dioxins safe. Safety was emphasised. A press conference was held in the locality and TV, radio and press interviews were given. A formal press statement was also issued.

11.1.5 The second Public Meeting was held in July 1995 to announce the NRA's intention to let the river clean up the dioxins naturally as this was the safest option. A press conference was held in the locality and TV, radio and press interviews were given. A formal press statement was also issued. A separate briefing was held for local politicians. A commitment was given to further public meetings.

11.1.6 Informal communications were maintained with the MEP. Local pressure groups were informed via a single contact.

11.2 PUBLIC RELATIONS STRATEGY

11.2.1 The early agreement of an overall Public Relations strategy which identified target groups, preferred means of communications and responsibilities together with an anticipated programme, greatly helped the satisfactory promotion of the Project.

11.2.2 As individual landmarks were approached, detailed plans were drawn up to achieve good public, local authority and media reception. Performance was reviewed on completion and the findings used to improve future stages.

11.2.3 As the direction of the Project changed to a natural clean up with no legal case, the existence of an overall strategy facilitated this major change as the basic structure and aims of the overall strategy provided the framework for the new detailed strategy required.

11.3 PUBLIC RELATIONS BUDGET

11.3.1 Very early in the Project, the original budgetary provisions were reassessed and reallocated to allow the establishment of a separate Public Relations budget. This had two major benefits:

- It emphasised the importance to the Project of successful and accurate communications with the public, local authorities and media.
- It focused the requirements for presentations and dealing with the media as estimates had to be made at a very early date of the requirements (and hence monetary costs).

11.3.2 Control of the Public Relations budget was delegated to the Public Relations representative on the Project Team. This increased the Public Relations commitment to the Project and enabled the Public Relations Department to take a far more pro-active role in the promotion of the Project.

11.4 MESSAGES TO PUBLIC, LOCAL AUTHORITIES AND MEDIA

11.4.1 Although the overall message was the same, the details and slant required for the public, local authorities and media were subtly but noticeably different. There were however, well established informal links between these three groups so messages had to be consistent.

11.4.2 There were difficulties encountered at the first Public Meeting where no special arrangements were made for the local authority councillors and their officers. Councillors felt either constrained in what they could say in front of constituents or deliberately attacked the NRA to prove their independence. This problem was circumvented by having separate public/local authority meetings during the second round.

11.4.3 At the first Public Meeting, which was called to announce the results of the sample analysis, it was clear that several members of the public were expecting to hear full details of what the NRA intended to do. At that point the NRA were a long way off deciding ways forward and this should have been made crystal clear.

11.4.4 At both meetings the Project Manager was put forward as the NRA's contact point rather than referring all queries through the NRA's Public Relations department. This worked well as it was perceived as demonstrating greater commitment by the NRA.

11.5 TIMING AND LOCATION OF MEETINGS

11.5.1 Because of the rapid progress made on the Project, public meetings had to be called at what was perceived as short notice (generally two weeks).

11.5.2 There was no ideal time for calling meetings as longer delays would have resulted in accusations of sitting on results etc. This was only a factor for the public and more especially local councillors but had little effect on the media who generally operate on much shorter timescales. There was some criticism of short notice at the first public meetings and this anticipated and covered by direct reference to its necessity at the second public meeting.

11.5.3 For the second Public Meeting, the first choice of venue which was centrally located was unavailable. Advice of the local authority was taken on an alternative. This was unsatisfactory and despite putting on a minibus, attendance was lower than anticipated and reports of people boycotting the meeting because of local rivalries were heard.

11.5.4 Local dissemination of information on meetings was good but was further reinforced after the first set of meetings to cover potential gaps. Venue for meetings was a critical point and this needs local verification by the NRA rather than relying on outside advice.

11.6 COMPLEX MESSAGE

11.6.1 The concepts and realities of dioxins contamination, measurement, analysis etc and risk assessment are complex (but no more complex than other issues the NRA may have to address on other projects).

11.6.2 In order to fully explain matters to the public and media, it was essential to approach things from the most basic levels. Most people for example had no concept of what one nanogram per kilogramme (the unit for measuring dioxin contamination) was or meant.

11.6.3 There were however several members of the public who had an excellent knowledge of all aspects of dioxins and their implications and so simplifications had to be kept accurate and defensible at all times. Analogies, examples and diagrams were found to give the best results.

11.6.4 Much of the research work carried out on the dioxins was of great interest to NRA staff and covered critical areas of the Project, e.g., how and what sediment particles the dioxins adhered to. However, they were of very limited interest to the public who were focused on the levels and associated effects. These areas of distraction were identified and avoided at the meetings.

11.6.5 Ove Arup were asked to give a broad presentation at the first meeting to demonstrate their expertise and suitableness for the appointment. Intriguingly, their reputation and creditability was enhanced by the fact that most of the public could not understand what they were explaining about the methods of carrying out a full risk assessment. Experts are supposed to be baffling!

11.7 POLLUTER AT PUBLIC MEETINGS

11.7.1 The company whom the NRA believed to be responsible for the dioxin contamination of the Doe Lea (the "Polluter") insisted on being represented at both public meetings and press conferences. It must be accepted that this will happen as the Polluter was as interested as the NRA in the publicity and what was said. Trying to exclude the Polluter would have led to very adverse public relations as they would have claimed to have been gagged etc. The Polluter's presence made the conduct of the first meeting significantly more difficult as the public wished to question the Polluter rather than listen to the NRA.

11.7.2 The situation was avoided at the second public meeting by briefing the Polluter before the meeting and so removing his need to be present at the meeting to hear developments. This was done immediately prior to the meeting to avoid the Polluter pre-empting the meeting by releasing details early.

11.7.3 No specific lessons can be drawn as they are totally dependent on the individual polluter concerned. However, the Project assessed the effect of the Polluter's presence and formulated contingency plans. This reduced the potential for damage.

11.7.4 Consideration was given to excluding the Polluter from meetings but this was not viable at public meetings. At the press conferences, the Polluter was permitted to observe but not address the media.

11.8 PUBLIC HEALTH

11.8.1 Public Health is not an issue that the NRA can take action over, yet most of the public concerns over any contamination relate directly and specifically to public health.

11.8.2 Before the public meetings, the Project determined its stance that all Public Health matters should be referred to the Environmental Health. This stance was cleared with Environmental Health and their officers fully briefed before each meeting.

11.8.3 The stance was made explicitly at both public meetings and subsequent questions on public health were met with the reply that it was a public health matter and the NRA had made all details fully and freely available to the Environmental Health. This worked well and defused the situation.

11.8.4 Consideration was given to having Environmental Health representatives at the public meetings to take questions but this was rejected as it would have been a major distraction from the NRA's main objectives.

11.9 BEST PRACTICES IDENTIFIED

1. Set up overall Public Relations strategy very early on.
2. Establish separate budget for Public Relations aspects.
3. Delegate control of Public Relations budget to Public Relations.
4. Have a member of Public Relations staff on the Project Team.
5. Messages must be consistent yet take account of different group needs.
6. Separate public/local authority meetings.
7. Project Manager named as contact point.
8. Check acceptability of venue location and means of local publicity.
9. Keep messages clear and simple and address public concerns.
10. Plan for the polluter being present.
11. Agree stance on public health with Environmental Health

did they have their own?

Dated

Yes, please.

Ian

SCIENTIFIC DEPARTMENT
Floor 3, Kings Meadow House

NRA

National Rivers Authority
Thames Region

M E M O R A N D U M

TO: I.M. ADAMS

P Lloyd, R Walker, J Harris. WQ Group. SDMT.

CC: Huw Williams

FROM: David Stott
Water Quality Manager

My Ref:
Your Ref:

DATE: 15.12.

Tel-External: (0734) 535302
Tel-Internal: (7-25) 5302

RE: DoE LEA

I ATTENDED MEETING ON 14/12 HELD BY NTY REGION WHICH I FOUND INTERESTING.

I AM COPYING ROUND THE CONCLUSIONS FROM THEIR BEST PRACTICES REPORT. I WILL LOAN THE 'PLAIN ENGLISH' & 'BEST PRACTICE/PROJECT' REPORT IF REQUESTED.

I CAN DISCUSS AS AN ITEM AT NEXT ROS. PMEG/EQC/SDMT AS APPROPRIATE.

REGIONAL SCIENTIFIC
15 DEC 1995
16
MANAGER

Kings Meadow House
Kings Meadow Road
Reading
Berkshire
RG1 8DQ
Fax: (0734) 502974

National Rivers Authority
Northumbria & Yorkshire Region

NOT FOR PUBLICATION BEFORE
12 NOON on, Wednesday, 13th September 1995

Meeting: *Yorkshire RRAC* *Subject:* *Dioxins in the River Doe Lea*

Date: *13th September 1995* *Paper No:* *YRRAC/58*

1.0 BACKGROUND

1.1 The full background to the dioxin contamination of the River Doe Lea was reported to the Committee at its meeting of 8th March 1995. In 1991 the NRA discovered that sediments within the Doe Lea were grossly contaminated with dioxins in excess of any found elsewhere within England and Wales. The Region set up a project to investigate the possibilities of cleaning up a short section of the Doe Lea and to look into the preparation of a legal case to recover the costs of this clean up under Section 161 of the Water Resources Act 1991.

2.0 THE DOE LEA RESTORATION STUDY

2.1 The prime purposes of the project were to investigate ways of cleaning up the dioxin pollution within the Doe Lea and then, if viable, carry out the clean up of a short section of the river. The study incorporated the investigation of legal action against the polluter under Section 161of the Water Resources Act.

2.2 There were three main areas of investigation in the study and expert consultants were appointed to undertake the following:-

- Analysis of further samples from the sediments of the Doe Lea to determine current levels of dioxin pollution and, if possible, to prove the source of the pollution. This was carried out by Professor Hagenmaier of the University of Tubingen, Germany, who is one of the leading European experts in the field of dioxin analysis.

- Determination of the effects of varying dioxin levels on the aquatic environment. This work was carried out by WRc of Medmenham and utilised their great experience in the fields of dioxin and the aquatic environment in general.

- Risk assessment of the options for carrying out any sediment clean up. This was carried out by Ove Arup, Consulting Engineers.

In addition, legal advice on all aspects of the project and to prepare the legal case against the polluter, was provided by the Solicitors, Dibb Lupton Broomhead.

3.0 RESULTS OF THE STUDY

3.1 Samples of the sediments in the Doe Lea taken in March 1995 showed that dioxin levels had reduced by 95% since samples were taken in 1991. However, levels were still between 5

and 40 times higher than any other levels detected elsewhere in England and Wales and were still high enough to cause concern.

3.2 Many options were examined for dealing with the dioxin polluted sediments which covered treatment in-situ, removal, separation from the river water by a number of methods and transport from site. In addition methods for the ultimate disposal of the sediments such as incineration and landfill were also investigated.

3.3 The result of the risk assessment carried out by Ove Arup of the various options showed that the safest option was not to disturb the sediments and allow the river to disperse the contaminants naturally.

4.0 LEGAL POSITION

4.1 In 1993, the NRA was given expert legal advice that a criminal prosecution under Section 85 of the Water Resources Act was very likely to be unsuccessful primarily because of the wording of the Discharge Consent. This was a consent that had been inherited by the NRA from Yorkshire Water. A clean up of the sediments followed by recovery of costs under Section 161 was considered to be the only viable way for the NRA to establish legal responsibility against the polluter. As the NRA will not be carrying out any clean up of the river, no legal case can now be taken against the polluter.

5.0 IDENTIFICATION OF THE POLLUTER

5.1 From the evidence and advice of its experts, the NRA is satisfied that the most probable source of the dioxin pollution in 1991 was Coalite Chemicals Limited. Since 1991, Coalite Chemicals has ceased operating its incinerator, which was the most likely producer of the dioxins and carried several modifications and improvements to its drainage system. These improvements include routing all discharges to an improved biological effluent treatment plant, the construction of a storm water storage lagoon to prevent inundation of the treatment plant during heavy rainfall.

6.0 HMIP LEGAL CASE

6.1 The HMIP case against Coalite Chemicals for the airborne escape of the dioxins in 1991, received its initial hearing at Nottingham Crown Court on 20th July 1995. On present information received from HMIP, the case is unlikely to be decided until after HMIP has joined with the NRA and Waste Regulators to form the Environment Agency.

7.0 PUBLIC RELATIONS

7.1 The local residents, local authorities, MPs, MEPs and media have been kept fully informed on all progress and developments on the Doe Lea Restoration Study and public comments have been actively sought.

7.2 A public meeting and press conference were held in Staveley on 23rd May to announce the results of the March 1995 sediment samples, and to announce the NRA's intention for fully investigating options for dealing with the dioxin pollution and, if safe to do so, cleaning up a section of the Doe Lea.

7.3 On the 18th July 1995, a briefing of Councillors, a public meeting and a press conference were held in the Staveley area, to announce the following:-

- Levels of dioxins had fallen by 95% and were now approaching levels at which they would cease to be a hazard to the aquatic environment.

- The best and safest option for dealing with the dioxins was to continue allowing them to disperse naturally.

- No legal case could now be taken by the NRA against the polluter, although another case related to dioxins was to be brought by HMIP.

- Coalite Chemicals Limited was the likely source of the dioxin pollution in 1991 but the NRA was now ensuring that there would be no reoccurrence. Any current dioxins were well below levels at which they would be a problem.

- The NRA would continue to monitor the river until the dioxins reduced to normal levels.

- Other NRA instigated initiatives meant that there had been a significant improvement in the overall state of the Doe Lea.

- The NRA would report back on progress to the public.

There was general, but by no means universal, acceptance of the NRA's decision not to attempt to remove the dioxins, but there was great public concern that Coalite Chemicals were seen to be escaping sanctions.

8.0 WAY FORWARD

8.1 The following actions are being implemented:-

- A programme of monitoring has been established on the Doe Lea, Rother and Don to determine the extent, concentrations and movements of dioxins within the river system.

- A plain English report is being produced on the Doe Lea Restoration Study for public release.

- Public Meetings and liaison meetings with local authorities will be held in October/November.

- All information on the dioxin toxicity studies is to be provided for assessment in the development of Environmental Quality Standards.

- The possibility of promoting an International conference on dioxins is being investigated.

GERARD MORRIS
Water Resources & Quality Manager (Southern Yorkshire)
August 1995

APPENDIX 1 - LIST OF ALL BEST PRACTICES IDENTIFIED

SECTION 3 - ESTABLISHMENT OF PROJECT

1. Establish a project immediately on the realisation that a problem exists.
2. Determine preferred legal option as soon as practicable.
3. Establish a dedicated Project Team.
4. Give consideration to setting up a permanent National "Flying Squad" team to deal with major events.

SECTION 4 - PROJECT MEMBERSHIP

1. The third tier budget manager should be the Project Executive.
2. Project Board to function as "Project Management Committee" and run the Project until the Project Manager is appointed.
3. The Project Board should be comprised to provide a balanced expert backup over the range of the Project.
4. The NRA members of the Project Team should have expertise and experiences sufficient to cover all the key elements of the Project.
5. Cross functional NRA Project Team.
6. If viable, locate Project team in one office. If not, reinforce team building and communications.
7. Regular agreeing, updating and reporting of internal Project Team members time requirements with their line managers.
8. Full and prompt circulation of full Project Board meetings via e-mail.
9. Assess the possible effects of any loss of key witnesses or team members and draw up contingency plans to minimise adverse effects.
10. Recognise and assess the effects of establishing the Project on the staffing and budgets of functions that Project members are drawn from.
11. Be prepared to take on support staff to cover work normally carried out by Project Team members (consider training needs).

SECTION 5 - LEGAL CASE

1. Assess legal options as soon as possible

2. Clarify legal position of the "polluter cleans up" clause in the new Environmental Protection Act.

3. Develop the legal case at the same time as any clean up.

4. Pass day to day control of expert witnesses to Solicitors if beneficial to the case.

5. Consider direct contact and instructions to the external Solicitors by the Project Manager.

6. Hold regular expert witness meetings.

7. Assess legal costs for preparing legal case and for going to court as soon as practicable and review when significant changes to the Project occur.

8. Assess level of costs due if NRA wins or loses the legal case.

9 Apply project management methods and controls to important legal cases.

SECTION 6 - COMMUNICATIONS

1) Single line hierarchical reporting using common reports. Project Board minutes to be used as the basis for these.

2) On a rapidly varying Project, monthly briefings of the Regional General Manager immediately prior to National Board meetings.

3) Ensure that there is full awareness of national and international implications and Department of the Environment's needs and reasons for information.

4) Collate and index all relevant files and documentation.

SECTION 7 - LIABILITIES

1. Assess potential for legal action by third parties against NRA over any clean up.

2. Assess probability of NRA being joined into defending a legal action with the polluter.

3. Assess scale of liabilities and include as background to project authorisation.

4. Minimise risk by adjusting project and passing on liabilities via insurance.

SECTION 7 - LIABILITIES - continued

5. Assess effects of defendants costs.

6. Assess the potential effects of taxation of both NRA and defendants costs.

7. Avoid taking on responsibility for further clean ups.

SECTION 8 - INSURANCES

1. Identify insurance sensitive commissions before appointing consultants or contractors to a project.

2. Request proof of adequate insurance cover at pre-tender interviews.

3. Consider offering a range of liability limits for tender.

4. Make it clear that insurance provisions will be a criterion used for assessing tenders.

5. Review Clause 21 of the NRA Terms of Appointment.

6. Do not seek one-off insurances for high risk projects. They are unlikely to be available.

7. Assess what proportion of the appointment is for the provision of insurance. Determine if this is reasonable.

8. Use insurance reluctance as a trigger to review project liabilities and risks.

9. Obtain expert opinion on insurance provisions.

10. Ensure that the Consultant fully appreciates the insurance implications and has received expert advice.

SECTION 9 - SAMPLING

1. Use only experienced samplers.

2. Use NRA standard methodology for obtaining samples.

3. Tripartiting of cored sediment samples is problematic and case law is uncertain.

4. For contaminants adhering to sediment particles, consideration should be given to sieving samples before analysis in order to obtain the particle size/contaminant relationship.

SECTION 9 - SAMPLING - continued

5. For contaminants adhering to sediment particles, consideration should be given to analysing for organic carbon content and its effect on contaminant levels.

6. Take more frequent particle size and organic carbon samples (which are relatively inexpensive) to build up a more accurate picture of the overall sediment in the river.
7. For long term monitoring, use identifiable repeat locations.

8. Assess what sampling programme would be considered as being representative of the river.

9. Other contaminants must be tested for and assessed before removal or treatment of the sediments is actioned.

10. Consider setting up a sample archive to enable past samples to retested.

11. Ensure samples are stored securely and safely.

SECTION 10 - WHAT IF SCENARIOS

1) Establish a defined methodology for looking at possible variations and planning for them.

2) Include all Project Team members in the process.

3) Detailed monitoring and recording of the variations and alternative strategies.

4) Identify and concentrate on major variations.

SECTION 11 - PUBLIC RELATIONS

1. Set up overall Public Relations strategy very early on.

2. Establish separate budget for Public Relations aspects.

3. Delegate control of Public Relations budget to Public Relations.

4. Have a member of Public Relations staff on the Project Team.

5. Messages must be consistent yet take account of different group needs.

6. Separate public/local authority meetings.

SECTION 11 - PUBLIC RELATIONS - continued

7. Project Manager named as contact point.
8. Check acceptability of venue location and means of local publicity.
9. Keep messages clear and simple and address public concerns.
10. Plan for polluter being present.
11. Agree stance on public health with Environmental Health

APPENDIX 1 - LIST OF ALL BEST PRACTICES IDENTIFIED

SECTION 3 - ESTABLISHMENT OF PROJECT

1. Establish a project immediately on the realisation that a problem exists.
2. Determine preferred legal option as soon as practicable.
3. Establish a dedicated Project Team.
4. Give consideration to setting up a permanent National "Flying Squad" team to deal with major events.

SECTION 4 - PROJECT MEMBERSHIP

1. The third tier budget manager should be the Project Executive.
2. Project Board to function as "Project Management Committee" and run the Project until the Project Manager is appointed.
3. The Project Board should be comprised to provide a balanced expert backup over the range of the Project.
4. The NRA members of the Project Team should have expertise and experiences sufficient to cover all the key elements of the Project.
5. Cross functional NRA Project Team.
6. If viable, locate Project team in one office. If not, reinforce team building and communications.
7. Regular agreeing, updating and reporting of internal Project Team members time requirements with their line managers.
8. Full and prompt circulation of full Project Board meetings via e-mail.
9. Assess the possible effects of any loss of key witnesses or team members and draw up contingency plans to minimise adverse effects.
10. Recognise and assess the effects of establishing the Project on the staffing and budgets of functions that Project members are drawn from.
11. Be prepared to take on support staff to cover work normally carried out by Project Team members (consider training needs).

SECTION 5 - LEGAL CASE

1. Assess legal options as soon as possible

2. Clarify legal position of the "polluter cleans up" clause in the new Environmental Protection Act.

3. Develop the legal case at the same time as any clean up.

4. Pass day to day control of expert witnesses to Solicitors if beneficial to the case.

5. Consider direct contact and instructions to the external Solicitors by the Project Manager.

6. Hold regular expert witness meetings.

7. Assess legal costs for preparing legal case and for going to court as soon as practicable and review when significant changes to the Project occur.

8. Assess level of costs due if NRA wins or loses the legal case.

9 Apply project management methods and controls to important legal cases.

SECTION 6 - COMMUNICATIONS

1) Single line hierarchical reporting using common reports. Project Board minutes to be used as the basis for these.

2) On a rapidly varying Project, monthly briefings of the Regional General Manager immediately prior to National Board meetings.

3) Ensure that there is full awareness of national and international implications and Department of the Environment's needs and reasons for information.

4) Collate and index all relevant files and documentation.

SECTION 7 - LIABILITIES

1. Assess potential for legal action by third parties against NRA over any clean up.

2. Assess probability of NRA being joined into defending a legal action with the polluter.

3. Assess scale of liabilities and include as background to project authorisation.

4. Minimise risk by adjusting project and passing on liabilities via insurance.

SECTION 7 - LIABILITIES - continued

5. Assess effects of defendants costs.

6. Assess the potential effects of taxation of both NRA and defendants costs.

7. Avoid taking on responsibility for further clean ups.

SECTION 8 - INSURANCES

1. Identify insurance sensitive commissions before appointing consultants or contractors to a project.

2. Request proof of adequate insurance cover at pre-tender interviews.

3. Consider offering a range of liability limits for tender.

4. Make it clear that insurance provisions will be a criterion used for assessing tenders.

5. Review Clause 21 of the NRA Terms of Appointment.

6. Do not seek one-off insurances for high risk projects. They are unlikely to be available.

7. Assess what proportion of the appointment is for the provision of insurance. Determine if this is reasonable.

8. Use insurance reluctance as a trigger to review project liabilities and risks.

9. Obtain expert opinion on insurance provisions.

10. Ensure that the Consultant fully appreciates the insurance implications and has received expert advice.

SECTION 9 - SAMPLING

1. Use only experienced samplers.

2. Use NRA standard methodology for obtaining samples.

3. Tripartiting of cored sediment samples is problematic and case law is uncertain.

4. For contaminants adhering to sediment particles, consideration should be given to sieving samples before analysis in order to obtain the particle size/contaminant relationship.

SECTION 9 - SAMPLING - continued

5. For contaminants adhering to sediment particles, consideration should be given to analysing for organic carbon content and its effect on contaminant levels.

6. Take more frequent particle size and organic carbon samples (which are relatively inexpensive) to build up a more accurate picture of the overall sediment in the river.
7. For long term monitoring, use identifiable repeat locations.

8. Assess what sampling programme would be considered as being representative of the river.

9. Other contaminants must be tested for and assessed before removal or treatment of the sediments is actioned.

10. Consider setting up a sample archive to enable past samples to retested.

11. Ensure samples are stored securely and safely.

SECTION 10 - WHAT IF SCENARIOS

1) Establish a defined methodology for looking at possible variations and planning for them.

2) Include all Project Team members in the process.

3) Detailed monitoring and recording of the variations and alternative strategies.

4) Identify and concentrate on major variations.

SECTION 11 - PUBLIC RELATIONS

1. Set up overall Public Relations strategy very early on.

2. Establish separate budget for Public Relations aspects.

3. Delegate control of Public Relations budget to Public Relations.

4. Have a member of Public Relations staff on the Project Team.

5. Messages must be consistent yet take account of different group needs.

6. Separate public/local authority meetings.

SECTION 11 - PUBLIC RELATIONS - continued

7. Project Manager named as contact point.
8. Check acceptability of venue location and means of local publicity.
9. Keep messages clear and simple and address public concerns.
10. Plan for polluter being present.
11. Agree stance on public health with Environmental Health